

## Induction of Expression of Phycocyanin Alpha Subunit Gene from *Spirulina platensis* in *E.coli*

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**Background & Objectives:** *Spirulina platensis* is an edible filamentous cyanobacterium and Phycocyanin pigment exceed to 20% of the total protein. Phycocyanin has various biology activities and is utilized in a number of applications in foods, cosmetics and pharmaceuticals. Hence it is a suitable option for industrial production. A lot of advantages of phycocyanin studied by many researchers however the scale-up Methods remain difficult and expensive. In the other hand the production of recombinant phycocyanin is more convenience and inexpensive to scale-up. The purpose of this study was to expression of phycocyanin alpha subunit gene in *E.coli* for industrial production purposes.

**Methods:** Phycocyanin alpha subunit gene was isolated using specific primers and cloned. The recombinant strain verified by sequencing. The gene expression was examined in *E.coli* containing pET43.1a+-CpcA vector while was inculcated to TB broth including 50µg/ml ampicilin. The induction was done by IPTG (1mM final concentration) as inducer. Samples were taken before and at 1, 2, 4, and 8 h intervals after induction and analyzed by 12.5%SDS-PAGE.

**Results:** The SDS-PAGE analysis showed a protein band in induced cells in comparison with non-induced cells and it was in the range of 20-25kDa of the protein size marker. Also the protein bands of 2 and 4 h post-induction were denser.

**Conclusion:** The molecular weight of alpha subunit phycocyanin with 6×His tag and HSV tag were estimated about 20.92 kDa. Regarding the absence of the protein band in this range in non-induced samples, we verified phycocyanin alpha subunit gene expression in *E.coli* recombinant strain. High expression of this gene in recombinant strain is because of T7 strong promoter and terminator in pET43.1a+ expression vector.

**Keywords:** Phycocyanin Beta Subunit Gene; *Spirulina*; Expression; PET 43.1a+